Model Summaries

for

Renewable Energy Modeling Summit

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Contents:
Summary Table
Amiga
IPM
MARKAL
NEMS
MiniCAM

MODEL	Purpose and Type	Major Sectors	Major Outputs	Number of US Electric Sector Regions	Endogenous Computation of Inter-Regional Transmission	# of RETs Modeled in Electric Sector	Time Horizon (Time Intervals)
AMIGA	Detailed 200+ sector and technology rich General Equilibrium Model of U.S. Economy through 2050	Household demand Government purchases and progams Residential buildings and appliances Commercial buildings and appliances Motor vehicles Electricity generation unit inventory Industry production activities Industrial capital Foreign trade	Sectoral costs, prices, and outputs Demands, prices, costs and outputs of interrelated products, including induced activities, such as transportation and wholesale/retail trade GDP, employment and other aggregate macroeconomic impacts; emissions and control cosrs	1	No	6 Wind, Geo-thermal, Biomass, Building Integrated PV, Fuel cells, Other	1998 – 2050 (1-year)
IPM	Linear programming optimization model of the electric power and boiler sectors in the U.S.	Electric power markets and stand-alone boilers Fuel markets: Coal, Natural gas, Biomass (Oil prices exogenous) Environmental markets	Electric sector generation and fuel consumption (including CHP) Boiler steam output Electricity conversion technologies Wholesale electricity prices Electric sector air emissions Air pollutant allowance prices	User defined; 26 for EPA Base Case	Yes	6 (in EPA Base Case) Wind, Geo-thermal, BGCC, Solar Thermal, Solar PV, Landfill Gas	2005 – 2025 (5-year) (in EPA Base Case)
MARKAL	Identify optimal choices of technologies and fuels to meet given demand for energy services. Partial equilibrium bottom-up energy system technology optimization model employing perfect foresight and solved using linear programming.	Energy sector total life cycle Industry Commercial and service sector Households Agriculture Transportation	Energy consumption, supply and price by fuel type Technology market share and marginal price Consumption by sector Criteria pollutants: SO2, NOx, PM10, CO2, VOC	1	No	Wind, Solar, Biomass, Geothermal, hydro; with multiple instances for each type	1995-2050 (5-year)
NEMS	Estimates the outcome of economic decisions about energy production, energy conversion, and energy consumption. General equilibrium model focusing on energy market behavior in the U.S.	Energy Demand: Residential, Commercial, Industrial, and Transportation Electricity Renewables Oil Supply, Natural Gas Supply, Coal Supply Natural Gas Transmission and Distribution Refining	Fuel quantity and price by fuel type Conversion technology market share and price Consumption by sector Energy prices Selected air emissions	13	No	7 (> 50 total techs. possible) Wind, Geo-thermal, Wood & Biomass, Solar Thermal, Solar PV, MSW, Ethanol, Conventional Hydropower	20 to 25 year projection period (1-year)
MiniCAM	Analysis of technologies and policies related to GHG emissions, with long-term, global capability and 14 regions. Partial-equilibrium model (energy and land-use) and a reduced-form climate model.	End Use in Buildings, Industry, and Transportation Supply sectors: fossil-fuels, biomass (traditional & modern), electricity, hydrogen, synfuels	GHG emissions, atmospheric effect, and temperature change, costs of GHG abatement, energy use by fuel by region, agriculture and land use changes	1	No	7 Wind, Geo-thermal, Bio-mass, Solar PV, Hydroelectric, Other	1990 – 2095 (15-year)